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Avalanche Notes

U.S. Forest Service
Westwide Avalanche Network

DECEMBER 1992

Weather

The storms of December dumped copious snows over the mountain West. A series of Pacific storms brought above-normal snows to the Cascades of Oregon and Washington and record snows to the Sierra of California. These storms traveled inland to drop above-normal snows throughout the Intermountain region. In the Central and Southern Rockies region, the storm track favored southern Colorado and northern New Mexico. Alaska was far north of the storm track, so that Alyeska recorded only 74% of normal December snowfall.

The Cascades received snowfall over most of December; for example, Mt. Rainier, WA recorded snow on 25 days. The strongest storms hit on the 9th-11th when 30-37" fell at all sites, and on the 20th-23rd when Mt. Rainier got 40" and Stevens Pass, WA, 44". For the month, Mt. Rainier and Crystal Mountain, WA, and Mt. Hood Meadows, OR, all recorded 130% of normal, while Stevens Pass got 135%.

The Sierra got hit with only two storms, but these were intense and prolonged. The first struck on the 6th and lasted till the 12th. On these seven days, Sugar Bowl recorded 98" of snow, and Alpine Meadows, 95". On the 9th alone, Sugar Bowl got 37", and Alpine Meadows, 30". (Alpine Meadows also recorded 4.4" of water equivalent in 12 hours.) The second storm came on the 29th and extended into January. On the 29th-31st, Alpine Meadows recorded 54" of snow, Sugar Bowl, 65", and Kirkwood Meadows, 88". For December, Kirkwood received 225" (not shown on the weather data sheet), and Alpine's snowfall of 172" was a new December record and was 280% of normal. The intensity of these storms is also shown by the wind: Kirkwood recorded a gust to 136 mph on the 13th, and Alpine saw a gust to 115 mph on the 29th.

(Using the very good weather records at Alpine Meadows as an index of snowfall in the Sierra, the drought that has plagued the region becomes obvious. In only one (1988-89) of the last nine winters has snowfall been above the long-term normal. The cumulative effect has taken a toll on water resources, vegetation, and wildlife. Based on the weather of December and January (which you'll see in January's Avalanche Notes), it appears the drought has been broken -- though only time will tell if 1992-93 is a wet aberration. The recent storms have been both a blessing and a curse, for the attendant flooding and landslides have caused extensive damage and loss of life.)

The Intermountain region thrived on these Pacific storms. Jackson Hole, WY saw light snow all month; Schweitzer Basin, ID recorded snow almost daily from the 8th-31st; and Snowbird, UT received 28" on the 12th-13th. For December, Sun Valley, ID and Jackson Hole both had 150% of normal snows; Teton Pass, WY, 140%; Snowbird, 120%; and Big Sky, MT, 110%. Only Bridger Bowl, MT, with 80%, got stiffed.

Rocky Mountain Forest and Range Experiment Station

Taos, NM benefitted from the southern storm track and wound up with 130% of normal. In Colorado, Purgatory and Wolf Creek also recorded 130% of normal. Wolf Creek received 34" on the 18th-19th and another 27" on the 28th-30th. Gothic in the central mountains squeezed out 104%, but all other sites were below normal. In the southern mountains, Telluride and Red Mountain Pass both got 90%; in the central mountains, snows ranged from a high of 96% at Aspen to a low of 55% at Crested Butte; and in the northern mountains, a high of 83% at Winter Park to a low of 27% at Vail.

Avalanche

Large numbers of avalanches fell at all Westwide sites in the Cascades and Sierra, as you would expect. Surprisingly, though, there were few avalanche accidents. One, however, was a fatal accident which occurred on December 30 on a steep slope within the town of Mammoth Lakes, CA. A 20-year-old man carrying a snowboard, his 11-year-old nephew, and two dogs were climbing the slope through waist-deep snow when they triggered the avalanche. The 11-year-old and one dog were partly buried, while the 20-year-old and the other dog were buried. 80 rescuers searched the avalanche for 3 hours before the victim was located by a probe line. He was buried 4 feet deep and was dead from suffocation. Probers also found the dog, which had died.

There were three other fatal avalanche accidents in December:

- (1) On the 3rd at Vail, CO, a 22-year-old skier triggered a slide in the East Vail Chutes, an area outside the ski-area boundary which is accessed through a gate. The man had become separated from his companion, and therefore the avalanche was not witnessed. The next morning a probe line struck and recovered the victim from under 2 feet of snow. This slope was within 100 feet of another avalanche accident that occurred two days earlier. In this incident the victim was swept into a tree and suffered severe internal injuries.
- (2) On the 21st near Stanley, ID, a miner on snowshoes triggered and was buried in an avalanche while staking a claim. The next day a rescuer struck the victim with a spot probe, and his body was recovered from 5 feet of snow.
- (3) On the 28th on Togwotee Pass, WY, a 36-year-old student on a NOLS course triggered and was buried in an avalanche. The man was wearing a beacon, and though he was located and uncovered within 6 minutes, he was dead when uncovered, an apparent victim of suffocation.

In December, a total of 41 avalanche incidents were reported, with 51 people caught, 12 partly buried, 12 buried, 2 injured, and 4 killed. There were 6 vehicles caught, and 3 -- all snowmobiles -- were damaged. One building -- a house in Eagle River, AK -- sustained slight avalanche damage. Seasonal totals through December are 58 incidents, 74 people caught, 15 partly buried, 17 buried, 3 injured, and 9 killed.

November revisited

A fatal avalanche occurred on November 22 but was missed in the November issue of Avalanche Notes. At Healy, AK, two young boys were playing in a small gully when it avalanched. One was partly buried, one buried. The victim was dead by the time he was found by a probe and uncovered. He was nine.

U.S. FOREST SERVICE
WESTWIDE WEATHER AND AVALANCHE NETWORK
FORT COLLINS, COLORADO

DECEMBER 1992
SUMMARY OF WEATHER AND SNOW CONDITIONS

AREA	SNOWFALL			WATER EQUIVALENT						SNOW DEPTH			TEMPERATURE			WIND SPEED AND DIRECTION					
				MAX																	
	TOTAL	IN.	D	IN.	D	NUMBER	D	A	MAX	T	MIN	Avg	MEAN	MEAN	Avg	FOR	6 HOUR	PERIODS	FASTEST	D	
SNOW-FALL	24	A		TOTAL	24	A	OF DAYS		MAX	T	MIN	Avg	MAX	MIN	Avg	MO.	GE	GE	HOUR	T	
FALL	AVG	HR.	T	WATER	HR.	T	GE	GE	GE	GE	IN.	IN.	DEGREES F	DEGREES F	DEGREES F	15	16	20	MPH	DIR. E	
AREA	IN.	DEN	IN.	E	IN.	E	.1	.2	.5	1.0	IN.	E									

CENTRAL AND SOUTHERN ROCKY MOUNTAINS

ARAPAHOE BASIN, COLO	39.9	--	14	10	--	--	--	--	--	39	10	22	30	20.0M	1.5M	10.7M	--	--	--	--	--
ASPEN HIGHLANDS, CO	30.7	.08	5	30	2.34	.40	19	10	4	0	0	39	31	21	26	23.0	7.6	15.3	5.6M	3M	0M
BEAR LAKE, RMNP, CO	21.3	.08	4	31	1.67	.30	19	9	4	0	0	29	31	19	23	22.8	10.5	16.6	--	--	--
BEAVER CREEK, COLO	40.3	.05	9	31	2.13	.60	31	7	5	1	0	44	31	29	34	24.5	6.1	15.3	7.0	4	2
BERTHOUD PASS, COLO	38.0	.06	8	13	2.29	.44	13	9	4	0	0	34	13	23	29	21.1	2.4	11.7	15.4	67	30
BRECKENRIDGE, COLO	34.7	.06	10	10	2.24	.80	10	6	4	1	0	33	19	20	27	17.2	4.0	10.6	13.8M	50M	19M
COPPER MTN, COLO	28.0	--	8	10	--	--	--	--	--	--	--	31	19	22	27	23.2	5.9	14.5	21.5M	79M	66M
CRESTED BUTTE, COLO	24.0	.09	4	18	2.10	.40	18	13	4	0	0	34	31	17	22	19.8M	8.5M	14.1M	9.9	23	10
GOTHIC, COLO	55.5	.07	10	31	4.09	.77	29	8	8	4	0	45	31	21	28	23.6	-.5	11.5	--	--	--
KEYSTONE, COLO	23.5	--	6	10	--	--	--	--	--	--	--	26	19	19	22	23.6	4.5	14.1	--	--	--
MONARCH, COLO	40.4	.04	11	19	1.77	.46	17	7	4	0	0	43	19	22	27	22.7	6.2	14.5	--	--	--
POWDERHORN, COLO	40.0	--	8	6	--	--	--	--	--	--	--	44	19	30	34	21.6M	6.0M	13.8M	--	--	--
PURGATORY, COLO	64.8	.09	9	28	5.59	.95	29	10	9	6	0	50	30	18	31	19.3	6.4	12.8	--	--	15 220 18
RED MTN PASS U.S.550	39.0	.10	8	29	3.72	.80	29	8	7	4	0	42	28	26	31	26.3M	6.5M	16.4M	--	--	--
SUNLIGHT, COLO	38.5	.08	6	31	3.18	.55	30	11	6	2	0	43	31	23	28	23.6	8.0	15.8	--	--	--
TAOS, NEW MEXICO	53.5	.06	9	29	3.35	.65	5	9	7	4	0	60	30	36	45	24.4	11.1	17.8	12.8M	44M	14M
TELLURIDE, COLO	32.1	.08	6	30	2.50	.50	30	9	5	1	0	35	30	21	26	20.4M	8.7M	14.6M	--	--	--
VAIL, COLO	28.0	.06	6	6	1.65	.35	19	6	4	0	0	41	19	33	36	19.8	6.9	13.4	8.6M	9M	0M
WINTER PARK 1E, COLO	31.7	.06	9	13	2.01	.52	13	5	4	1	0	28	31	15	20	25.1	.2	12.6	--	--	--
WINTER PARK S.A., CO	52.6	.05	11	31	2.83	.60	19	8	4	3	0	43	31	24	31	18.0	4.5	11.2	8.4M	20M	8M
WOLF CREEK, COLO	82.3	.09	18	18	7.57	1.95	29	11	8	6	3	66	30	32	44	25.6	7.8	16.7	16.1M	68M	39M

INTERMOUNTAIN

BIG MOUNTAIN, MONT	84.5	--	12	18	--	--	--	--	--	77	31	42	58	--	--	--	--	--	--	--	--
BIG SKY, MONT	54.0	--	6	2	--	--	--	--	--	42	29	22	31	19.0M	6.4M	12.7M	8.0	16	1	--	--
BRIDGER BOWL, MONT	48.0	.06	10	16	2.85	.75	27	8	7	1	0	54	16	41	46	25.0M	9.0M	17.0M	11.5M	31M	10M
JACKSON HOLE 1, WYO	100.1	.09	12	9	8.67	1.20	30	18	16	8	3	63	30	29	45	17.5	11.1	14.3	18.8	84	52
PARK WEST, UTAH	74.0	.08	13	12	5.61	1.20	12	15	9	4	2	44	18	25	33	26.6M	14.1M	20.3M	11.3M	17M	11M
SCHWEITZER BASIN, ID	80.5	--	11	17	--	--	--	--	--	75	30	39	54	21.6	11.8	16.7	--	--	50	300	22
SNOWBIRD, UTAH	96.0	.08	19	12	7.81	1.46	12	14	13	5	2	73	19	49	61	26.6	11.5	19.1	25.4M	110M	87M
SUN VALLEY, IDAHO	48.5	--	8	29	--	--	--	--	--	50	31	20	29	18.7	9.1	13.9	9.9	36	8	30	310 23
TETON PASS, WYO 22	86.5	.07	13	9	6.21	.79	9	18	11	4	0	41	31	15	30	14.8	6.0	10.4	10.4M	20M	4M

WEST COAST

ALPINE MEADOWS, CAL	172.5	.12	33	9	21.40	4.70	9	15	13	10	7	91	31	5	48	31.7	20.8	26.2	34.4	118	108	80 230 28
ALYESKA, ALASKA	81.5	.05	13	7	4.49	1.16	2	11	5	3	0	89	14	70	79	22.2	12.8	17.5	4.1	1	0	19 140 30
CRYSTAL MTN 1, WASH	110.3	.06	15	9	6.18	1.13	11	16	9	5	1	67	29	26	50	25.8M	21.9M	23.9M	17.8M	72M	47M	45 160 8
CRYSTAL MTN 2, WASH	89.7	.05	14	11	4.52	.70	9	14	10	3	0	76	28	30	52	23.8M	15.6M	19.7M	--	--	--	--
EAGLECREST, ALASKA	66.1	.10	10	23	8.06	1.36	4	14	11	6	2	39	25	8	23	--	--	--	--	--	--	--
HEAVENLY VALLEY, CAL	128.0	--	30	9	--	--	--	--	--	--	--	95	30	1	43	32.4	13.8	24.7	--	--	--	--
MT. HOOD MDWS, ORE.	109.5	.16	14	9	17.85	2.19	9	21	18	14	7	95	30	39	69	30.6	20.2	25.4	18.5	70	59	62 280 21
MT. RAINIER PARADISE	151.7	.10	21	20	16.86	2.48	20	22	19	12	6	118	21	61	92	27.5	16.2	21.9	7.1	21	8	47 320 19
SNOQUALMIE PASS I-90	120.5	--	26	20	--	--	--	--	--	--	--	72	22	24	45	31.2	20.7	26.0	16.0M	75M	41M	--
SQUAW VALLEY, CALIF	137.5	--	30	29	--	--	--	--	--	--	--	90	30	0	36	32.6	14.4	23.5	--	--	--	--
STEVENS PASS 5E WASH	134.5	.20	18	27	27.66	3.80	23	17	16	12	8	77	27	31	50	25.5	18.3	21.9	12.9M	48M	32M	--
STEVENS PASS, WASH	132.5	.07	18	27	9.25	1.47	27	15	11	9	3	76	27	33	51	26.7	20.2	23.5	--	--	--	--
SUGAR BOWL, CALIF	175.0	--	37	9	--	--	--	--	--	--	--	131	30	24	80	30.1M	18.0M	24.0M	18.3M	69M	57M	--

-- DATA INCOMPLETE OR MISSING

M-ONE OR MORE DAYS OF RECORD MISSING-IF AVERAGE VALUE IS ENTERED, LESS THAN 10 DAYS RECORD IS MISSING

IF M IS ENTERED IN WIND SPEED COLUMN, LESS THAN 37 6-HOUR PERIODS ARE MISSING

GE--GREATER THAN OR EQUAL TO

**U.S. FOREST SERVICE
WESTWIDE WEATHER AND AVALANCHE NETWORK
FORT COLLINS, COLORADO**

**DECEMBER 1992
avalanche summary**

AREA	TOTAL A V A L S	TOTAL A V A L S	DATES OF A L S		NUMBER OF DAYS WITH MAX	TYPE OF AVALANCHE	FRACTURE LINE HEIGHTS IN FEET	VERTICAL DESCENT IN FEET		
	THIS MONTH NO.	THIS WINTER NO.	R A S S	I L S T	IN D A DAY NO. T	A U S F E S L	A R T U H R A D C A R F E S L L D T T E	SLABS	L O O S E	AVALS ACROSS MAJOR ACCESS ROADS NO.
						----- NUMBER-----	----- NUMBER-----	----- NUMBER-----	----- FEET	

CENTRAL AND SOUTHERN ROCKY MOUNTAINS

ARAPAHOE BASIN, COLO	15	24	7	22	4	11	8	0	7	8	4	11	0	0	13	2	0	14	9	2	1200	0	
ASPEN HIGHLANDS, COL	34	70	3	31	8	3	7	0	8	26	0	30	0	0	3	15	0	0	20	16	10	3200	0
BERTHOUD PASS, COLO	15	22	1	27	4	24+	8	0	2	13	3	12	0	0	8	2	1	13	3	0	500	0	
BERTHOUD PASS U.S. 40	7	9	10	31	3	11	4	0	6	1	1	6	0	0	6	2	0	5	3	1	2100	0	
BRECKENRIDGE, COLO	8	13	1	10	4	10	3	0	8	4	4	6	0	0	3	1	0	4	9	9	450	0	
COPPER MT., COLO	13	13	1	22	4	1	6	0	13	0	10	3	0	0	12	3	0	11	2	0	500	0	
CRESTED BUTTE, COLO	31	31	1	31	9	31	10	0	29	2	27	0	2	16	2	1	1	16	5	2	1600	0	
GOTHIC, COLO	45	55	9	31	13	18	8	0	0	45	4	36	0	5	31	6	0	43	28	16	2800	0	
LOVELAND BASIN, COLO	9	9	1	21	3	10	5	0	4	5	3	6	0	0	9	0	0	0	0	0	150	0	
MONARCH, COLORADO	12	12	15	26	6	20	4	0	8	4	10	2	0	0	12	7	1	10	1	0	500	0	
SUNLIGHT, COLORADO	4	4	17	31	2	31+	2	1	4	0	0	3	0	1	0	0	0	4	0	0	250+	0	
TAOS, NEW MEXICO	50	50	5	30	16	29	9	0	48	2	0	47	0	3	21	5	1	44	21	5	1000	0	
TELLURIDE, COLO	19	26	8	29	7	29	5	0	16	3	6	12	0	1	12	3	2	13	6	4	2400	0	
VAIL, COLO	4	4	3	19	1	19+	4	0	3	1	0	4	0	0	2	0	0	4	2	0	800	0	
WINTER PARK S.A., CO	5	5	4	31	2	31+	3	0	0	5	1	4	0	0	3	0	0	5	0	0	300	0	
WOLF CREEK, COLO	34	42	6	31	11	29	6	0	20	14	8	26	0	0	27	3	0	12	0	0	330	0	

INTERMOUNTAIN

BIG MOUNTAIN, MONT	31	31	9	30	16	20	6	0	31	0	4	24	0	0	10	0	0	14	0	0	400	0
BIG SKY, MONT	98	98	2	31	13	30	19	0	90	8	14	84	0	0	27	9	0	90	67	10	1600	0
BRIDGER BOWL, MONT	75	75	4	28	17	27	13	0	75	0	2	67	0	6	4	0	0	75	61	13	1200	0
JACKSON HOLE, WYO	111	111	1	31	28	4	15	1	93	18	5	106	0	0	94	17	2	108	50	10	2100	0
SUN VALLEY, IDAHO	13	13	9	30	5	9	3	0	13	0	0	13	0	0	13	0	0	4	0	0	200	0
TETON PASS, WYO	22	8	4	23	5	23	3	0	8	0	0	8	0	0	6	0	0	6	5	5	2500	5

WEST COAST

ALPENTAL, WASH	96	96	10	27	41	22	7	0	95	1	0	87	0	9	49	0	0	94	40	14	1500+	4
ALPINE MEADOWS, CAL	211	211	7	31	41	11	10	0	172	39	0	200	0	0	72	4	0	195	42	1	1000	5
ALYESKA, ALASKA	18	59	2	30	6	11	5	0	12	6	0	18	0	0	10	2	0	17	16	7	1600+	0
CRYSTAL MTN, WASH	210	222	8	31	37	20	16	0	205	5	0	206	0	4	19	0	0	200	95	9	1200+	0
HEAVENLY VALLEY, CAL	10	10	10	31	4	31	5	0	10	0	0	10	0	0	2	0	0	10	4	0	750	0
JUNE MOUNTAIN, CALIF	3	3	11	30	2	11	2	0	3	0	0	3	0	0	2	2	1	3	0	0	200	0
KIRKWOOD MOUNTS, CAL	61	61	7	30	21	18	9	0	46	15	3	58	0	0	55	9	0	54	22	4	1300+	0
MAMMOTH MTN, CALIF	30	30	8	30	11	8	5	0	30	0	0	20	0	10	0	0	0	22	4	4	1700	0
MT. HOOD MEADOWS	127	153	1	31	16	21	21	0	122	5	3	123	0	1	20	2	1	69	24	1	1450+	0
SNOQUALMIE PASS I-90	54	54	8	22	25	20	8	0	32	22	0	52	0	2	0	0	0	21	13	7	2800	3
SQUAW VALLEY, CALIF	164	164	7	31	36	29	10	1	162	2	0	164	0	0	49	19	2	102	21	7	1200	0
STEVENS PASS U.S. 2	33	33	10	27	13	22	6	0	31	2	0	33	0	0	24	1	0	32	32	22	2000	3
STEVENS PASS, WASH	326	326	1	29	70	20	14	0	322	4	14	294	0	18	40	17	0	0	0	0	0	0
SUGAR BOWL, CALIF	36	36	7	18	15	9	5	0	32	4	2	34	0	0	24	4	2	15	0	0	300	0

-- = DATA INCOMPLETE OR MISSING
GE = GREATER THAN OR EQUAL TO
♦ = ALSO OCCURRED ON OTHER DATES